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Vermont, the fern lover's paradise*

HAROLD GODDARD RUGG

For the person seeking a vacation resort in which he can find good botanizing, especially in the line of pteridophytes, I can recommend no better place than Vermont. Of the 109 species, varieties, and forms of these plants mentioned in Gray's New Manual 74 have been reported from Vermont. Of these it has been my good fortune to find all but thirteen. In addition to this number, all of the described hybrids except *Dryopteris Goldiana* × *spinulosa* Benedict and *D. cristata* × *Goldiana* Benedict have been reported in Vermont, and these two undoubtedly occur within the Vermont boundaries. Hardly a season passes but what some new and interesting botanical find is reported from Vermont. This last summer Miss F. E. Corne of Cambridge, Mass., was fortunate in finding *Dryopteris filix-mas* (L.) Schott, the male fern, in Barnard, Vermont, and also its hybrid with *D. marginalis* (L.) A. Gray in the same place. This is the fourth station in Vermont, and in fact in all the eastern United States, for the male fern and the second for the hybrid. Mr. E. J. Winslow was the lucky man to discover the hybrid, at a field meeting of the Vermont Botanical Club at Bridgewater in 1910. Why is it that this rare *filix-mas*, found not nearer than the eastern end of the Gaspé peninsula to the north and not nearer than northern Michigan to the west, has been found elsewhere only in Vermont and only in four adjoining Vermont towns: Barnard and Hartland, the first recorded station discovered September 1905 by Miss Nancy Darling, Woodstock and Bridgewater, stations found later by Miss Mabel Strong? May not this fern be looked for elsewhere in the state? The search for this rare fern alone should bring many fern lovers to our borders.

Undoubtedly the rarest fern ever found in Vermont is

*Presented at the winter meeting of the Vermont Botanical Club, March 1912.

the rare hybrid *Asplenium trichomanes* \times *ruta-muraria* Ascherson, a single plant of which was found Aug. 29, 1905, in Proctor, Vermont, by the late Miss G. A. Woolson. This is the only time on record when this fern has been found in America. The late Mr. George Davenport, in describing this fern in Rhodora, January 1906, states that the American specimens differ slightly from the described European forms in that the "lower pinnae are more deeply lobed or even divided." Now why should not others find this rare fern among the rocky pockets of western Vermont where both the parent plants are common? Miss Woolson, who discovered this rarest of all Vermont ferns, was also very successful in finding *Asplenium ebenoides* Scott in Vermont. She found this hybrid at Proctor and at Pittsford. It was first reported from Vermont in 1897, when it was discovered at Rutland by Mr. G. H. Ross. The only other Vermont stations are Salisbury and Brandon, the latter station discovered recently by Mr. D. Lewis Dutton. Vermonters living east of the Green Mountains can hardly hope to find this hybrid (now recognized as such, due to the study of Miss Margaret Slosson) as one of the parent plants, *Camptosorus rhizophyllus* (L.) Link, the walking fern, has been reported, I believe, from only six stations east of the Green Mountains: Brattleboro, Springfield, Windsor, Norwich, Plymouth, and Royalton.* The scarcity of this fern in eastern Vermont is due, of course, largely to the absence of limestone ledges. All of these stations, save the one near West Brattleboro, are small and the Windsor locality has been lost. In the Norwich station, located on the Loveland farm, which I have been fortunate enough to visit now and then, there is only a handful of plants. Well do I remember the day a few years ago in which I discovered the walking fern. I had gone pleasure-bent to Ethan Allen Park, Burlington, and suddenly came unexpectedly

* Since this paper was read I have found the fern at Hartland, Vt.

upon an isolated boulder covered with this charming fern. I took home plants for my garden, placed lime in the soil about them, and succeeded in keeping them alive for two or three years.

I do not wish to give a check list of Vermont ferns, as that has been done so well by Mr. W. W. Eggleston in his article, The Fern Flora of Vermont, in the Fern Bulletin, April 1905, but I shall give a few notes about some other species. Vermont claims seven of the *Aspleniums* beside *Asplenium ebenoides* Scott, previously referred to. To me the *A. viride* Huds. is one of the most delicate of our ferns and one worthy of a long day's tramp and scramble among the rocks. It was my good fortune to see this fern first in Smuggler's Notch and later at Mt. Hor, Lake Willoughby. Dr. Kennedy, in his Flora of Willoughby, Vermont, had included *A. viride* Huds. His evidence that the fern grew on Mt. Hor rested on two single loose fronds found at the foot of the precipitous slopes of the mountain. The growing fern was not discovered until Sept. 2, 1905, when Mr. E. J. Winslow risked his life in making the dangerous ascent of Mt. Hor. He was successful in locating the station and in 1910 guided me to the coveted spot. This station has, I believe, been visited by but two or three other fern lovers. Growing with *A. viride* on Mt. Hor may be found *Woodsia glabella* R. Br. I have tried to grow the little green spleenwort in my fernery, but unfortunately it has lived only a year or two. Mr. E. Gillett of Southwick, Mass., has it growing most successfully in his nursery, and last year I saw there some of the largest clumps I have ever seen. Beside the two mentioned stations for *A. viride*, it has been found at Camel's Hump, first by Mr. C. G. Pringle, and in Plymouth by Miss Strong. This last station, discovered a few years ago, is the lowest elevation at which the plant is known to grow.

Asplenium trichomanes L. is fairly common throughout Vermont, but its form *incisum* Moore is extremely rare. The latter has been reported, I believe, from Brattleboro, Hartland, and Norwich. The most deeply cut specimen of this form I have ever seen is in the Jessup Herbarium at Dartmouth College. *Asplenium platyneuron* (L.) Oakes is frequently met with. Its variety *serratum* (E. S. Miller) B. S. P. has been found in Pittsford and the variety *incisum* (E. C. Howe), named by Davenport as *Asplenium ebenum* var. *Hortoniae*, has been reported from Brattleboro and also from Pittsford, the latter one of the richest towns in the state in respect to its fern flora. Miss Slosson has reported forty-five species and six varieties from a three-mile triangle at Pittsford. In addition she has found there several of the hybrids, including the very rare *Dryopteris marginalis* \times *spinulosa* Slosson. Although this fern was recognized by Miss Slosson as a hybrid when it was first described, it was named *Dropteris pittsfordensis*.* A new station for this hybrid was found at Sherburne Mountain, July 8, 1909, and later, on Aug. 16, 1911, by Mrs. A. B. Morgan. The great variety of ferns reported from Pittsford, as well as from Dorset and Hartland, is due, doubtless, in some part to the fact that so many botanists have made these towns their headquarters. *Asplenium ruta-muraria* L. is found only in western Vermont, with the exception of a small station on Willoughby Mountain, or Mt. Pisgah as it is now called, and most frequently on lime rocks. *Asplenium angustifolium* Michx. is frequently seen, and in the stations in which I have found it it has always been associated with *Dryopteris Goldiana* (Hook.) A. Gray. Of course *Asplenium filix-femina* (L.) Bernh. is common everywhere, but one of its varieties deserves mention here. In 1897, at Woodstock, a single plant

* *Rhodora* 6: 75--77. f. 1--3. 6 Ap 1904.

of the variety *polyclados* Moore was found. This one plant was transplanted to the fernery of Miss Elizabeth Billings, where it has increased so that now there are several plants. This fern is one of the most striking that I have ever seen, and Mr. B. D. Gilbert said it was the most profusely branched and tufted variety of *A. filix-femina* that he had seen in this country.

Polystichum acrostichoides (Michx.) Schott and its incised variety are common. For several years I have had a peculiar form of this fern growing in my fern garden. It is interesting because of the truncate form of pinnae and the multifid form of the tip of the frond. The sterile fronds are usually like those of the type plant. This fern I transplanted into my garden several years ago, and ever since then it has continued to bear these peculiar fronds. The late Mr. B. D. Gilbert was interested in the plant and asked permission to describe it in the Fern Bulletin, but illness and finally his death prevented. *Polystichum Braunii* (Spencer) Fée is not rare in Vermont and may be looked for on high elevations or in low situations where there is a deep cool glen or ravine. Vermonters can boast of the type station of this fern at Smuggler's Notch, Mt. Mansfield. Mrs. Elizabeth B. Davenport found this fern in southern Vermont, at Brattleboro, at an elevation of not over 1,000 feet.

Of the genus *Dryopteris*, *D. simulata* Davenport is probably the rarest. This fern, found along the southern and eastern borders of the state, should be found more commonly in Vermont. To my knowledge there are only two Vermont stations, Brattleboro and Hartland, and unfortunately the exact location of either station is unknown today. This fern is abundant at Hinsdale, N. H., a town separated from Brattleboro, Vermont, only by the Connecticut River. *D. fragrans* (L.) Schott has been found at Mt. Mansfield, Bolton Notch, Camel's

Hump, and Mt. Zion. I have been fortunate enough to see this fern growing at Mt. Mansfield and Mt. Zion. This latter station, discovered in 1898 by Mr. G. H. Ross of Rutland, is most interesting. The station has been visited but three times since its discovery, first by Mr. Ross and Mr. Eggleston, second by Mr. Ross and Mr. Kirk, and in 1911 by Mr. Kirk and myself. One day in the early fall of 1911 Mr. Kirk and I tramped to the station from the electric car line in Castleton. As Mt. Zion is only a small hill of an elevation of about 1,000 feet and as other adjacent hills are similar in height and in appearance, it is not easy to locate the station. We discovered what we supposed to be the location and examined it closely several times, but not a single specimen of the fragrant fern did we find. After eating our lunch of toasted bacon and bread we were about to leave Hubbardton when by chance we discovered another hill with a rocky side, and here was our *D. fragrans* growing on the sheer face of a cliff fifty to seventy-five feet in height. Most of the plants grew on the east, while some grew on the northern wall of this rocky ledge, and all were sheltered from the sun and wind by trees growing near the ledges and hiding them. From a short distance away no one would suspect that one of the rarest New England ferns could be found near. In all, there were, perhaps, seventy-five plants, most of which, fortunately for botanists of future generations, are secure from collectors except those using ropes to be lowered over the cliffs. Some of the plants were very large and had about thirty fronds, I judge, of which only half were green. The peculiar appearance of the old dried and curled fronds surrounding the green living growth, together with the delightful woody fragrance, makes the identity of this fern easy to determine. This station is probably the farthest south in the eastern United States. Other members of the *Dryopteris* group that may be

found in the state are *D. Goldiana* (Hook.) A. Gray, *D. Boottii* (Tuckerm.) Underw., rather rare, *D. cristata* (L.) A. Gray, *D. Clintoniana* (D. C. Eaton), not nearly so common as *D. cristata*, *D. spinulosa* (Müller) O. Ktze., found in the highlands, *D. intermedia* (Muhl.) A. Gray, our most beautiful evergreen fern found in every deciduous forest. The so-called variety *dilatata*, found on the mountain peaks of Mansfield, Killington, Ascutney, and many others, proves to be the form *anadenia* (Robinson), while the true *D. dilatata* (Hoffm.) A. Gray remains still to be discovered in Vermont. One of the rarest plants growing in my fernery is *D. spinulosa* var. *concordiana* (Davenport), much more delicate in outline and in appearance and more yellowish green in color than the true *D. spinulosa* or *D. intermedia*. Mr. George E. Davenport had this plant growing in his fernery and gave part of his rootstock to Mrs. Emily H. Terry, who in turn kindly passed her plant on to me a few years later; and I have been able to pass on one small plant. This variety has, I believe, been found only at Concord, Mass., but we may hope to find it some day in Vermont.

Polypodium vulgare L. is found probably in nearly every town in the state, and in Burlington and Pittsford some of its varieties and forms have been reported. The three beech ferns, *Phegopteris phegopteris* (L.) Keys., *P. dryopteris* (L.) Fée, *P. hexagonoptera* (Michx.) Fée, are common in Vermont, although *P. hexagonoptera*, the broad beech fern, is quite rare. I have seen it growing at only one station in Vermont and that in Hartland. At the Hartland station there has been growing for three years a most interesting plant of this broad beech fern, with crested and plumose pinnae. The maidenhair, *Adiantum pedatum* L., and the brake, *Pteris aquilina* L., are likewise common. A variety of the brake, *Pteris aquilina pseudocaudata* Clute, was collected in Colchester

in 1903 by Mr. F. A. Ross. Up to that time Mr. Ross was the only person who had ever collected this fern in New England, but it has been lately reported from Nantucket and Cape Cod. Three sheets collected by Mr. Ross are in the herbarium of the University of Vermont and one in the herbarium of Mrs. Nellie F. Flynn. Three of these sheets were collected from burned-over ground, Colchester, and one from Woodwardia Bog, Fort Ethan Allen. This fern has not since been collected in Vermont, and it is hoped that in another year fern lovers may rediscover the fern for us.

Pellaea atropurpurea (L.) Link is limited, with two exceptions, I believe, to the limestone region of western Vermont. Mr. Levi Wild of the Vermont Botanical Club was fortunate in finding a few plants in Quechee Gulf in eastern Vermont, and several years later, with great difficulty, I was able to find the same plants or possibly another small station in the gulf. I believe Mr. Wild and I are the only people who have visited this station. I should advise no others to try to reach the same. The other station in eastern Vermont for the purple cliff brake is at Lake Willoughby. Quechee Gulf is also famous for being the home of our two alpine Woodsias, *Woodsia alpina* (Bolton) S. F. Gray and *W. glabella* R. Br. One naturally expects to find these ferns, as they are found, on the tops of our mountains, Mansfield, Camel's Hump, Pisgah, and Hor, but at Quechee Gulf they have sought the rocky and almost inaccessible side of a deep gorge, through which flows the Ottaquechee River. This gorge or gulf, as it is locally known, gives to the botanist *Woodsia ilvensis* (L.) R. Br. and *W. obtusa* (Spreng.) Torr., the latter sparingly, however. The latter is fairly abundant, I understand, in western Vermont, where the fronds are often a foot or more in length. It is rare in eastern Vermont, and where I have seen it growing it bears fronds usually

not longer than six or eight inches. At Mt. Pisgah Mr. Winslow was successful in finding the largest specimens I have ever seen of *W. alpina*. The largest frond he collected was eight inches long. Mr. George Lawson, in the Canadian Naturalist for 1864, speaks of the large specimens, often nine inches in length, which were collected in the Gaspé region, and suggests that the larger plant be distinguished as var. *Belli*. Another interesting Quechee Gulf fern is *Cryptogramma Stelleri* (Gmel.) Prantl. This is fairly abundant throughout Vermont in cool rocky exposures, yet it is rare enough to give the fern enthusiast a thrill of pleasure when discovering a new station. To my knowledge it is most abundant in Hartland, where one can view in June hundreds of the delicate little plants, most of which are inaccessible, fortunately for posterity.

Woodwardia areolata (L.) Moore has never been reported from Vermont, but its kin, *W. virginica* (L.) Sm., has been found in three widely distributed stations, Franklin, Colchester, and Rutland. I see no reason why the fern enthusiast should not add other Vermont stations for this fern, which I have seen growing only in Colchester, at a bog known as Woodwardia Bog to the Vermont botanists.

Dennstaedtia punctilobula (Michx.) Moore is common in rocky pastures and roadside wastes, but its variety *cristata* Maxon has been reported from Brattleboro only by the late Mrs. Horton, and the form *schizophylla* only from Dorset by Mrs. Terry. *Onoclea sensibilis* L. and *Matteuccia struthiopteris* (L.) Todaro are everywhere, as are *Cystopteris bulbifera* (L.) Bernh., in cool rocky glens, *C. fragilis* (L.) Bernh., the first of the deciduous ferns to uncurl its delicate fronds in the spring, and the three *Osmundas*. The only known station of *Osmunda regalis orbiculata* Clute is in Hartland, Vermont, and *O. Claytoniana dubia* Grant, known for some time

only from Vermont, has lately been reported from Maine, but *O. cinnamomea frondosa* Gray and variety *incisa* J. W. Huntington are fairly common, or at least not rare throughout the state. *Ophioglossum vulgatum* L., when once discovered, seems to spring up everywhere in moist meadow land, where the fronds are often eight inches long or longer, or in dry pastures, where the mature plants bear fronds only three or four inches in length.

The *Botrychium* group is represented by *Botrychium lunaria* (L.) Sw., discovered at Lake Willoughby. By this discovery of one single plant this interesting fern was added to the fern flora of New England, and as no other stations have since been reported, Vermont can claim the honors for the fern. *B. simplex* Hitchcock with its varieties and forms, according to some botanists, is fairly common throughout the state. It was my experience to plan to go to St. Johnsbury and to have Miss Rooney show me for the first time these plants, which she had previously described in the Fern Bulletin, but while en route to St. Johnsbury I discovered a few plants. The next summer I saw *B. simplex* growing in several places in Hartland, but search as hard as I might, I have never been able to find it in Norwich or in Caven-dish, towns in which I have botanized to some extent. Large colonies of *B. ramosum* (Roth) Aschers. are frequently met with in May or June along the edge of some woodsy road, but *B. lanceolatum angustisegmentum* Pease & Moore I have found in Vermont only once and then in Hartland. *B. obliquum* Muhl., its variety *oneidense* (Gilbert) Waters and variety *elongatum* Gilbert & Haberer, *B. dissectum* Spreng., *B. ternatum* D. C. Eaton, and the ever present *B. virginianum* (L.) Sw. are native to the state.

One fern that the fern enthusiast may hope to add to the Vermont flora is *Lygodium palmatum* (Bernh.) Sw., the climbing fern. This fern is found in Massachusetts

not many miles from the Vermont line. The only known New Hampshire station is on a small knoll in a swamp in the town of Winchester, only twelve miles from Brattleboro, Vt. Surely some day this fern will be added to the Vermont list. The only other fern species common to New England and not yet reported from Vermont are *Asplenium montanum* Willd., *Cheilanthes lanosa* (Michx.) Walt., not found farther north than Connecticut, *Woodwardia areolata* (L.) Moore, found most frequently in damp woods, and *Asplenium pinnatifidum* Nutt.

Inasmuch as Vermont claims five or six species and varieties not found elsewhere in New England, the claim that Vermont is a fern lover's paradise would seem to hold true.

HANOVER, N. H.

Another station in central Vermont for *Dryopteris filix-mas* and for the new hybrid *filix-mas* × *marginalis*

F. E. CORNE

Late last August, 1911, quite by accident, I found a new habitat for *Dryopteris filix-mas* and for the new hybrid *D. filix-mas* × *marginalis*,* in a hillside field near Barnard, Vermont. The altitude was between 1,700 and 1,800 ft. I visited some woods on the heights above the little Silver Lake House, where there were said to be limestone ledges and where I had hoped to find the little wallrue, *Asplenium ruta-muraria*, and other small rock-loving ferns for which I had so far searched in vain. I was disappointed, however, in finding any of these. I found no small ferns, but larger ones were there in abun-

* Winslow, E. J. Am. Fern Jour. 1 : 22, 23. 30 D 1910.